

CHARLES RIVER WATERSHED STUDY

STATUS REPORT

1 January 1968

Prepared by

New England Division, Corps of Engineers

424 Trapelo Road, Waltham, Mass.

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AUTHORITY

1. Resolved by the Committee of Public Works of the House of Representatives dated 24 June 1965. Assigned to NED by OCE, by letter of 1 July 1965.

STUDY AND REPORT

2. Scope. The study goal is a plan to meet present and future requirements for water supply, flood control, navigation, water quality control, recreation, fish and wildlife and other purposes requiring development of water and related land resources.

3. Coordination. A Coordinating Committee comprised of Federal and State agencies under the Chairmanship of the Division Engineer, New England Division, Corps of Engineers is as follows:

Federal

Benjamin Isgur, Department of Agriculture
Mark Abelson, Department of Interior
Edwin W. Webber, Department of Commerce
Frank Tetzlaff, Dept. of Health, Education & Welfare
Frank A. Batstone, Dept. of Housing & Urban Development

State

Robert L. Yasi, Dept. of Natural Resources
Howard Whitmore, Jr., Metropolitan District Commission
Robert G. Davidson, Metropolitan Area Planning Council

4. A Citizen Advisory Committee of 28 members affords contacts between the study agencies and special interest groups and municipalities of the Watershed.

DESCRIPTION OF STUDY AREA

5. The Charles River Watershed in eastern Massachusetts is at the northeastern end of the 500 mile Atlantic coastal megalopolis, Boston to Washington. The Charles River Watershed extends 31 miles southwesterly from Boston Harbor toward Providence and Woonsocket, Rhode Island, and includes all or parts of five cities and thirty towns, in parts of four Massachusetts counties. The 1965 watershed population was about 850,000. The Watershed is about 307 square miles in area and hour glass in shape; the length is 31 miles, and the widths are 15, 6 and 15 miles. Elevations vary from 560 feet, msl, along the southwesterly rim of the watershed in Milford and Hopkinton, to below 10 feet, msl, along the river through Watertown, Cambridge, and Boston.

ELEMENTS OF INVESTIGATION

6. The Charles River Watershed study goal is a plan for water resource conservation and development.

7. The principal items of work are shown on the attached "Schedule and Progress Chart", and are listed below. The inventory elements will provide basic data for development of the Watershed Plan and for preparation of Reports and Appendices.

A Lower Charles Interim Report and Appendices covering the Watershed downstream of Moody Street Dam, Waltham, is approaching completion.

8. The following paragraphs briefly describe the principal work items and their interrelations.

a. General and Economic. This item includes gathering general descriptive and historical information and urban data such as population, employment and land use. Projections of urban growth will be made through the year 2020 for determining needs for water resources and community services.

b. Flood Control. This item covers a determination of the extent and location of flooding in the watershed and means of preventing or reducing future flooding and flood damage along the Charles and its tributaries. Consideration is being given to a number of structural possibilities including increasing conduit and channel capacities, pumping flood runoff from the Charles River Basin to Boston Harbor during periods of high tide, and finally reservoir storage in the upper Charles and its tributaries to retain flood flows. Non-structural measures under consideration include flood plain zoning, and flood proofing of existing buildings.

c. Reservoir Storage. Consideration is being given to single and multiple-purpose storage reservoirs on the Charles and its tributaries. Storage may be used to provide improvement for fish and wildlife, for recreation, for water supply, for low-flow augmentation and for flood control.

d. Low-Flow Augmentation. Low-flow augmentation depends principally on releases from reservoir storage. On occasion, low flows in the lower Charles have been augmented by inputs of aqueduct waters from MDC non-Charles sources. Alternative means of low-flow augmentation and benefits to pollution abatement and recreation are being considered.

e. Water Supply. Present water uses and sources of supply are being inventoried, and future needs are being estimated.

To meet the estimated future needs, consideration will be given to the adequacy of water resources available within the Charles watershed and to the need for increasing the existing draft on outside sources.

f. Fish and Wildlife. A number of approaches are being examined for preserving and improving fish and wildlife habitat in the Charles and its tributaries, including lakes and ponds, and related land resources. Selection of measures to be considered in depth will depend on the flood control, reservoir storage, low-flow augmentation and sewerage and pollution control measures recommended under items b, c, d, and e, above.

g. Pollution and Sewage. In this item, two kindred but separate topics are being studied. In the downstream half of the watershed, most of the piped municipal sewage goes into the MDC trunk sewer system, with treatment and discharge into the Atlantic Ocean, off Deer

Island, outside Boston Harbor. Storm peak sewage overflows from combined sewers in the older, densely built-up municipalities of the Lower Charles may be found to be significant sources of pollution. The FWPCA is inventorying and identifying water quality and pollution sources on the Charles and tributaries.

h. Recreation and Open Space. To meet the recreation and open space needs of the numbers of watershed residents and of visitors, scheduled studies will identify and evaluate available water and related land resources and will list and describe suggested locations for future acquisition and development by Federal, state, municipal or private agencies.

i. Navigation. This item is a study to determine the present use and future needs of commercial navigation and recreation boating, particularly in the Lower Charles. It will include an appraisal of the existing locking facilities and an evaluation of the improvements incorporated in a new dam proposed at Warren Avenue by MDC.

9. The Lower Charles Interim Report will draw together selected information from the above listed topics, but only pertaining to the lower $12\frac{1}{2}$ miles of the Charles below Moody St. Dam, Waltham, bearing mainly on flood control, navigation (both commercial and recreational) and pollution in that part of the River.

SCHEDULE AND PROGRESS

10. Hearings and Meetings have been held as follows:

a. Public Hearings (digest available)

Waltham, 17 January 1967
Wellesley, 19 January 1967
Franklin, 24 January 1967

b. Coordinating Committee Meetings (minutes available)

9 December 1966
18 April 1967
26 September 1967

c. Citizen Advisory Committee Meetings (apply to Committee
for Minutes)

1 May 1967
8 June 1967
4 October 1967

11. Study Progress is stated below by the work items described in paragraph 7, (above). Schedule and progress also are shown on the attached Chart.

a. General and Economic. Physical features of the Watershed have been examined and inventoried. April 1965 aerial photographs have been secured. U. S. G. S. and other map resources have been examined. Maps at 3,000; 2,000, and 1,000 ft. per inch scale have been prepared of the entire River, and 500 ft. per inch scale sheets of the Lower Charles. A centerline profile with water surface and approximate river bottom elevations has been made. Bridges and dams have been inventoried, examined, photographed, and recorded. Sonic soundings of the Charles River Basin, 1967, have been compared with prior soundings of 1902.

The population and urbanization of the Watershed are reported as of 1765, 1865 and 1965. The future population and further urbanization of the Watershed are being studied with recognition that the Watershed is part of the American Atlantic Megalopolis.

Archaeologic and prehistoric aspects of the Watershed are being studied by a consultant to the U. S. National Park Service.

Historic sites and buildings from 1600 A.D. onward are being inventoried by the Commonwealth of Massachusetts Historical Commission. The recorded locations are being relayed for highway planning purposes to the Federally-aided Eastern Massachusetts Regional Planning Project. Inventories were completed in June 1967 in Arlington, Charlestown, Cambridge, Lexington, Lincoln and Somerville, in the Lower Charles, and in Bellingham, Franklin, Foxboro, Hopkinton, Medway, Milford and Wrentham, in the Upper Charles Watershed.

Seventeen additional inventories are under way as follows: additional parts of Boston; also all of Belmont, Brookline, Waltham, Watertown, Wayland, Weston, and Westwood in the Lower Charles; also Ashland, Dover, Holliston, Hopedale, Medfield, Mendon, Millis, Sherborn, and Walpole in the Upper Charles Watershed. Six Charles River municipalities are not yet scheduled for historic inventory: Dedham, Natick, Needham, Newton, Norfolk and Wellesley.

b. Flood Control. Abstracts have been made of relevant records of rainfalls, runoff, tides, storms, and of prior flooding on all sections of the Charles and on the Muddy River in Brookline and Boston, including studies made 1956-59 for the Metropolitan District Commission by their consultants.

c. Reservoir Storage. The Corps is studying main river storage potentials and is considering other means of storage at and above Watertown Dam. The U. S. Department of Agriculture, Soil Conservation Service, is studying storage potentials on Tributaries of the Charles at and upstream of South Natick Dam. Operations of the Hobbs Brook and Stony Brook Reservoirs in the City of Cambridge Water System have been examined.

d. Low-Flow Augmentation has been a continuing goal in the search for additional storable or economically divertable waters for the Charles. The legislative authorization and specific requirements

for M. D. C. addition of dilution waters to the Charles have been studied, also the record of M. D. C. waters actually supplied, year by year, in recent years. The monthly and daily low-flow records of the Charles at the three U. S. gaging stations on the River have been studied, relative to the river conditions reported at the January 1967 public hearings.

e. A Water Supply inventory of the entire Watershed, town by town, is being made from NENYIAC and other Federal sources, also from Commonwealth of Massachusetts data in the Massachusetts Department of Natural Resources, and in the Metropolitan District Commission. A two-thirds Federally-aided consulting report to the M. A. P. C. on water supply and distribution in the entire M. A. P. C. area, including much of the Charles River Watershed, is due 1 July 1968. A Federally-aided reconnaissance report to the Eastern Massachusetts Regional Planning Project, dated May 1967, has been examined. It covers all 35 Charles River municipalities.

f. Fish and Wildlife Resources of the Charles are briefly mentioned in a preliminary report of January 1967 by the U. S. Department of the Interior, Fish and Wildlife Service, with cooperation by the Commonwealth of Massachusetts, Department of Natural Resources, Fish and Game Division. A biological examination and report by study sectors on the entire 80-mile length of the Charles River is under way. A narrative report on a field reconnaissance of the River the summer of 1967 is being prepared.

g. Pollution and Sewage Disposal. Sources of pollution along the Charles and tributaries are being geographically located, and are being identified as to nature of effluent and agency sources, by the Federal Water Pollution Control Administration. Forty-two inflows located by the FWPCA were mentioned at the 26 September 1967 Charles Coordinating Committee meeting. Charles River water quality data were taken during the summer of 1967 at 17 sampling stations along the River. These data and samples are being analyzed at the Robert A. Taft Sanitary Engineering Center (Cincinnati, Ohio) of the FWPCA.

M. D. C. Sewage Collection and Disposal facilities and procedures for Charles River Watershed communities below South Natick Dam have been examined. Improvements in the order of \$110 million capital outlay are under way, as reported to the April 18, 1967, and September 26, 1967 Coordinating Committee meetings, including \$1 million Federal aid for a \$4 million 233 mgd storm-and-sewage overflow detention chamber scheduled to be built in Cambridge on the north bank of the Charles near the Boston University Bridge.

An inventory of sewage collection and disposal facilities and procedures in Charles River communities up-stream of South Natick Dam is being made from NENYIAC and other Federal sources, also from the Commonwealth of Massachusetts data in the State Department of

Public Health. A two-thirds Federally-aided consulting report to the MAPC on sewerage in the entire MAPC area, including much of the upper Charles Watershed, is due 1 July 1968. A Federally-aided reconnaissance report to the Eastern Massachusetts Regional Planning Project, dated May 1967, has been examined. It covers all 35 Charles River municipalities.

h. Recreation and Open Space. The Corps has transcribed for the 35 Charles River Watershed municipalities the 1966 Massachusetts Department of Natural Resources wetlands inventory maps and related evaluations, town by town. In addition, the Corps has transcribed the Department of Natural Resources 1964 open space inventory work maps and matching identification lists for fifteen of the 35 Watershed cities and towns. Two Metropolitan Area Planning Council reports, each two-thirds Federally-aided, are awaited: one on the Charles, Neponset and Mystic Rivers; the other on open space needs and recommendations for the 79 municipalities of the M.A.P.C. area, which includes 30 of the 35 Charles River Watershed cities and towns.

i. Navigation. From Corps records an abstract has been made of commercial vessel movements through the Charles River Dam Lock at Leverett Street, Boston, for several years.

From M.D.C. records, the Corps has made an abstract of recreational boat movements through the lock, 1940-1966. From the

Boston City Planning section of the Boston Redevelopment Authority, the Corps has received a list and location map of recreational boating organizations, boating facilities, and numbers and kinds of boats, on the Charles River Basin and on Jamaica Pond. Both the Corps and the BRA are studying the boating peaks, and the capacities of the various sections of the $8\frac{1}{2}$ -mile length of the Basin (17 miles shoreline) to sustain these or other boating and recreational and open space activities.

12. Progress to date on the foregoing nine study topics is reflected on the attached chart.

CHARLES RIVER STUDY PUBLICATIONS

13. The following publications and Interim Memos have been issued to date:

a. General Publications

- (1) Plan of Survey, 29 pp., plus Charles River Map and Study Sequence Chart.
- (2) Information Pamphlet for January 1967 Public Hearings, 7 pp, plus Charles River Map and Profile Diagram.
- (3) Digest of January 1967 Public Hearings, 45 pp: 23 pages Summary, plus 22 pages Attendance List.
- (4) Announcement re Charles River Study and Citizen Committee, 1 p, Map, Chart, List.

b. Summaries of Coordinating Committee Meetings:

9 December 1966, 3 pp.

18 April 1967, 10 pp and exhibits

26 September 1967, 9 pp and 20 pp appendices and exhibits

c. Study Status Reports:

1 July 1967, 5 pp and chart

1 October 1967, 12 pp and chart

1 January 1968, 12 pp and chart and publications list.

d. Interim Memos:

(1) Watershed Areas, 6 pp and Map, also Diagram

(2) Charles River Basin Sonic Soundings, 2 pp, Map,
4 sheets of sections

(3) Stony Brook Sub-watershed, 4 pp and diagram

(4) Population and Urbanization, 1765-1965, 23 pp and
3 maps

(5) Higher Education, 1966

(6) Charles River Archaeological Field Survey 1967, 3 pp

(7) Open Space & Recreation Aspects of the Lower Basin, 4 pp

(8) Recreational Boating Downstream of Moody Street Dam
and other navigational data, 17 pp, map, pictures, 4 pp.

CHARLES RIVER WATERSHED COMPREHENSIVE STUDY

SCHEDULE AND PROGRESS CHART

1 JANUARY 1968

